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CENTRAL INTELLIGENCE AGENCY
WASHINGTON 25, D. C.

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10 MAF 1966

BYE-2300-66

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MEMORANDUM FOR: Director, National Reconnaissance Office

SUBJECT: Summary Report of Major Aircraft Accident
Resulting in the Loss of A-12 Number 126,
28 December 1965

1. In response to your verbal request of General Ledford, the following is a summary report on the analysis, findings, and corrective action taken as a result of the loss of aircraft number 126 on 28 December 1965.

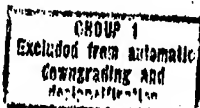
a. History of Flight

(1) On 28 December 1965, Mr. Mele Vojvodich was scheduled to fly A-12 aircraft number 126 on a performance check flight which included a rendezvous beacon test with a KC-135 tanker. Mission planning was accomplished by the mission planning staff. Weather was satisfactory for the mission. An F-101 was scheduled as chase aircraft for applicable portions of the mission.

(2) The pilot and chase pilot were briefed for the mission by the operations staff. Subsequent to the briefing, Mr. Vojvodich computed the necessary takeoff data and went to suiting on schedule after which he was driven to the aircraft to be strapped into the cockpit.

(3) The aircraft was preflighted by the maintenance ground crew in accordance with existing procedures. A ground crewman was in the cockpit completing check list items when the pilot arrived. This delay is not considered significant. The Interior Preflight, Starting Engines and Before Taxing checks were accomplished in accordance with the Flight Manual without discrepancy.

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(4) The aircraft was taxied to the runway and the Before Takeoff checklist completed. Compressor stall was encountered while trimming the left engine. This engine was down trimmed slightly to correct this condition and all other checks completed normally.

(5) The aircraft was cleared for takeoff and began takeoff roll at 1254 PST. Gross weight was approximately 118,300 pounds with a 20.9% CG. Takeoff distance was computed as 6800 feet. The takeoff appeared normal, however, some witnesses indicated that the ground roll was a little longer than usual. This could not be ascertained and is not considered significant to the accident. Rotation began at 190 knots and liftoff occurred at approximately 210 knots. Immediately after the main gear left the ground, the aircraft yawed to the left followed by a pitch maneuver. A series of violent yawing and pitching actions followed very rapidly with the aircraft becoming uncontrollable. The pilot attempted to regain control of the aircraft with no apparent response to stick and rudder movements. He ejected at the top of the maneuver as the aircraft went into the final pitchdown from which the crash occurred. Estimated altitude at the point of ejection is between 150 and 200 feet above the ground. Estimated elapsed time from lift-off to impact was less than 30 seconds. The aircraft impacted first on the left wing and broke into many segments as it slid across the frozen lake bed for approximately one mile in a 300 foot wide path. The pilot landed to the left of the aircraft wreckage track and received only minor injuries.

b. Investigation and Analysis

(1) Immediately after the accident General Ledford appointed an Accident Investigation Board consisting of qualified personnel from the Office of the Aerospace Safety Division, Inspector General, United States Air Force,

(2) After detailed examination and analysis of all the available data and evidence, it was determined that the only area of

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investigation which showed a direct involvement with the cause of this accident was in the maintenance and materiel fields.

(3) Statements by the pilot, chase pilot, mobile control officer and many other witnesses were studied; the 16mm movie film of the takeoff was reviewed; data extracted from the INS was examined; and crash recorder data was checked. Analysis of all information showed fairly conclusively that the aircraft began a series of violent and uncontrollable yawing and pitching gyrations immediately after lift-off. The pilot ejected at probably the last possible moment before the aircraft crashed.

(4) In response to the maintenance and materiel groups finding of the incorrect rate gyro wiring harness installation (see paragraph (5)), the pilot and two other qualified A-12 pilots were taken to Beale AFB where all three accomplished test takeoff runs in the SR-71 flight simulator. Each pilot accomplished both normal and unannounced malfunction takeoffs in which the yaw and pitch rate gyro functions to the stability augmentation system (SAS) were reversed. Results of these tests showed conclusively that the aircraft was completely uncontrollable under the malfunction conditions. The gyrations of the simulator were practically identical to those experienced by the pilot of A-12 S/N 126 just before the crash.

(5) The sequence of events and subsequent investigation of the wreckage pinpointed the cause of the accident as being due to the SAS pitch gyros being connected to the yaw servos and vice versa. The results of incorrect connection are two-fold. First the aircraft in this situation does not have any stability augmentation in the pitch and yaw axes. Secondly, every input into one axis induces a command into the other axis in the following manner:

Pitch Up commands Left Yaw
Pitch Down commands Right Yaw
Left Yaw commands Pitch Up
Right Yaw commands Pitch Down

Thus, when the pilot applied aft stick force to rotate the aircraft,

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the pitch rate gyro commanded a large rudder input which produced left yaw. This evidenced on the aircraft only upon elimination of the gear restraining force at lift-off. The left yaw commanded additional pitch up which in turn commanded left yaw, etc. Pilot corrective action for either of these motions is augmented by the servo inputs action upon the wrong gyro signals resulted in a severe right yaw and nose down motion. When the pilot corrected for this motion he pitched up and yawed left.

c. Findings

(1) Primary Cause. The primary cause of this accident was maintenance error in that a flight line electrician was negligent in performing his duty. He connected the wiring harnesses for the yaw and pitch rate gyros of the stability augmentation system in reverse.

(2) Contributing Causes.

(a) A contributing cause was supervisory errors by the electrical supervisor and the inspector, both of whom failed to perform their duties properly.

(b) A second contributing cause was a design deficiency which made it possible to physically connect the wiring harnesses to the yaw and pitch rate gyros in reverse.

d. Corrective Action

(1) After the accident, General Ledford convened and chaired a contractors meeting on field inspection/maintenance at [] on 13 January 1966. In attendance were representatives of all the primary contractors associated with the OXCART vehicle.

(2) General Ledford set the tone of the meeting by requiring all contractors to redouble their efforts at working toward a zero defects level of maintenance.

(3) As a result of this meeting, and in compliance with the recommendations of the Accident Investigation Board, the

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following specific actions have been taken or are in the process of being accomplished:

(a) Mr. Kelly Johnson of Lockheed Aircraft Corporation is making necessary arrangements for improving LAC personnel supervision and training. He is also improving the techniques of distribution of technical material to LAC maintenance personnel.

(b) Other contractors are implementing end-to-end checks and more definitized procedures in the Lockheed/other contractor equipment interface areas.

(c) Renewed detailed attention will be given to compliance with Service Bulletins.

(d) Types and numbers of checklists are being expanded as rapidly as possible. Two engineers are working full time to develop the required checklists and/or expand the existing lists.

(e) [] has established an eighty-hour course for mechanics and a forty-hour course for supervisors and inspectors to insure adequate maintenance training at all-levels. A training record system has been developed to insure that all maintenance personnel receive this training as well as refresher courses at periodic intervals.

(f) A preliminary inspection of all areas where possible "Murphy's Law" conditions might exist has been completed. LAC is making a detailed review of the entire aircraft design to discover any possible similar conditions. This review is to be completed by 1 March 1966. Provision has also been made for inspection of all aircraft anytime a new "Murphy" item is discovered.

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(g) [] jointly proposed a system of added supervisory technical monitors. Headquarters has authorized the additional Detachment personnel required.

(h) To improve the quality of supervisors, a number of coordinated organizational changes are being effected within the DCM and contractor personnel structure at [] including changes to lines of responsibility and functional areas.

2. A complete and detailed report of the accident investigation is on file in the office of Brigadier General Leo P. Geary.

[]
Director of Reconnaissance, CIA

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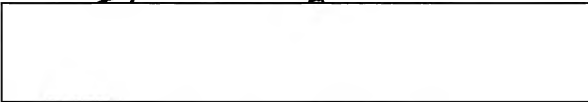
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Signature Recommended:



Jack C. Ledford
Brigadier General USAF
Director of Special Activities

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